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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/468,452	12/21/99	CHESTER A	10102-2

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EXAMINER	
ILDEBRANDO,C	
ART UNIT	**PAPER NUMBER**
1754	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary	Application No.	Applicant(s)	
	09/468,452	CHESTER ET AL.	
	Examiner	Art Unit	
	Christina Ildebrando	1754	

-- The MAILING DATE of this communication app ars on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *1-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18)☐ Interview Summary (PTO-413) Paper No(s). _____ .
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-16, drawn to a process, classified in class 208, subclass 113+.

II. Claims 17-30, drawn to a catalyst, classified in class 502, subclass 65.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process such as a catalyst for the reduction of nitrogen oxides in exhaust gas.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Malcolm Keen on March 19, 2001 a provisional election was made with traverse to prosecute the invention of Group II, claims 17-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

6. Claim 23 is objected to because of the following informalities: claim 23, line 2, "have has" should be "have." Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

8. Claims 17-18, 21-27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Vasalos et al.

Vasalos et al. (US 4,153,535) discloses a catalyst composition useful in catalytic cracking processes. The composition comprises a molecular sieve cracking catalyst and a metallic reactant and preferably contains a metallic promoter (column 3, lines 39-45 and column 4, lines 20-40). Vasalos et al. teaches that both the metallic reactant and metallic promoter can be incorporated into the molecular sieve cracking catalyst

(column 14, lines 46-55). The metallic promoter and metallic reactant may be incorporated by ion exchange or impregnation (column 15, lines 6-15). The average particle size of the composition is in the range of from about 20-150 microns (column 9, lines 35-40).

Examples of a suitable metallic promoter include vanadium and compounds thereof (column 5, lines 1-5). Examples of suitable reactants include rare earth metals (column 5, lines 18-25). Cerium is exemplified (column 26, Example 4). Inventive examples detail the use of the promoter and reactant in oxide form, which suggests that the vanadium is present in an oxidation state greater than zero. Vasalos et al. teaches that when the promoter comprises vanadium, it is present in an amount in the range of from about 10ppm to about 10 weight percent and when the reactant comprises rare earth metals, it is present in an amount in the range of from about 0.2-10 weight percent (column 6, lines 43-48 and column 7, lines 23-32).

Suitable molecular sieves include Y-type zeolites and ultrastable, large-pore crystalline aluminosilicates (column 9, lines 62-68). Vasalos et al. teaches a silica to alumina ratio of at least about 2-12:1, preferably 4-6:1 (column 9, lines 50-55). The composition can further comprise a matrix (column 4, lines 49-65).

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Vasalos et al.

9. Claims 17-20, 23-25, and 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang.

Huang (US 5,705,729) discloses a catalyst composition useful in alkylation processes. The catalyst comprises a large pore zeolite such as USY (column 4, lines 25-35). With respect to the unit cell sizes, alpha values, and silica to alumina ratios instantly claimed, it is the examiner's position that the USY taught by reference would inherently have the values instantly claimed. The zeolites are preferably partially or fully exchanged with at least one rare-earth cation, such as cations of cerium (column 4, lines 52-55). Huang further teaches that the catalyst can be used in combination with one or more hydrogenating metals selected from Group VIII metals or transition metals which can be exchanged into the composition (column 4, lines 56-60). The composition may be incorporated with a binder or other suitable matrix (column 5, lines 38-40 and column 6, lines 10-15). The catalyst can be shaped into a wide variety of particle sizes and is generally such to pass through a 2 mesh screen and be substantially retained on a 400 mesh screen 9column 5, lines 30-38).

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Huang.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 19-20 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vasalos et al. as applied to claims 17-18, 21-27, and 30 above, and further in view of Chu or Miller et al.

Vasalos et al. is applied as above for claims 17-18, 21-27, and 30 above.

Vasalos et al. does not specifically teach that the ultrastable large-pore crystalline aluminosilicate is ultrastable Y (USY).

Chu (US 4,549,956) teaches that conventional cracking catalysts include large pore zeolites such as zeolite Y in its ultrastable form (column 5, line 56 – column 6, line 10).

Miller et al. (US 4,340,465) teaches that conventional cracking catalysts include large pore zeolites, including Y-type zeolite and preferably USY (column 7, lines 23-38).

It would have been obvious to one having ordinary skill in the art to modify the invention of Vasalos et al. in light of the teachings of either Chu or Miller et al. Vasalos et al. teaches the suitability of large pore zeolites in ultrastable form. Both Chu and Miller et al. teach that USY is a large pore zeolite conventionally used in catalytic cracking processes. Therefore, one of ordinary skill would have been motivated to use USY as the cracking catalyst component in the composition taught by Vasalos et al. Because all three compositions taught are useful in the same process, i.e. catalytic cracking, one would have reasonable expectation of success from the combination. With respect to the unit cell sizes, alpha values, and silica to alumina ratios instantly claimed, it is the examiner's position that the USY taught by the Chu and Miller et al. references would inherently have the values instantly claimed.

12. Claims 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang as applied to claims 17-20, 23-25, and 28-30 above.

Huang is applied as above for claims 17-20, 23-25, and 28-30.

Huang does not teach the amount of cerium exchanged into the zeolite composition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Aller*, 105 USPQ 233.

13. Claims 17-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al. in view of Miller et al. or Scherzer et al.

Fischer et al. (US 4,919,789) discloses a catalyst composition useful in the production of high octane gasoline. Fischer et al. teaches that the catalyst comprises a zeolite, preferably with a silica to alumina ratio of at least 10:1 and alpha values greater than 1, i.e. 50 (column 7, lines 15-20 and column 8, lines 38-50). Suitable zeolites include USY (column 8, lines 3-18). It is the position of the examiner that the USY of the reference would inherently have the unit cell size instantly claimed. Fischer et al. teaches that the original cations of the zeolite may be replaced by ion-exchange with rare earth metals (column 9, lines 40-60).

Fischer et al. further teaches that the catalyst further comprises a metal component such as vanadium in an amount between 0.1-25 % by weight, preferably,

0.1-5 % by weight (column 10, lines 1-10). The metal component may be incorporated by ion exchange or impregnation (column 10, lines 9-10).

Fischer et al. does not specifically teach the use of cerium as the rare earth metal.

Miller et al. (US 4,340,465) teaches a catalyst composition useful for cracking processes (column 8, line 15). Miller et al. teaches that it is desirable to exchange the original cations of the zeolite with rare earth metals, including cerium (column 8, lines 15-26 and 38-40). Miller et al. teaches that the rare earth metal content of the zeolite is generally from 0-22 % by weight (column 8, lines 30-35).

Scherzer et al. (US 3,676,368) teaches a catalyst composition useful for cracking processes (column 1, lines 5-10). Scherzer et al. teaches that it is desirable to exchange the ions of a faujasite zeolite with rare earth ions, including cerium (column 1, lines 40-45 and column 4, lines 12-15). Scherzer et al. teaches that the total rare earth content of the zeolite should be in the rage 6-14 % by weight and specifically teaches the use of a 1-55% by weight cerium solution, which would lead to 0.06-7.7 % by weight cerium in the zeolite (column 1, lines 40-45 and column 4, lines 12-15).

It would have been obvious to one having ordinary skill in the art to choose cerium as the rare earth metal in the catalyst taught by Fischer et al. in light of the teachings of either Miller et al. or Scherzer et al. Fischer et al. does not disclose the specific use of cerium, but rather teaches the generic group of compounds, "rare earth metals." The claims differ from the reference by reciting a specific species and a more limited genus than the reference. However, it would have been obvious to one having

ordinary skill in the art at the time of the invention to select any of the species taught by the reference, including those of the claims, because an ordinary artisan would have the reasonable expectation that any of the species of the genus would have similar properties and, thus, the same use as the genus as a whole. Further, both Miller et al. and Scherzer et al. teach that cerium is a known promoter in catalytic cracking operations. Therefore, one of ordinary skill would have been further motivated to choose cerium as the rare earth metal, with a reasonable expectation of success from the combination.

The modified teachings of Fischer et al. further do not teach the particle size of the catalyst composition. However, it is considered it would have been within the level of one of ordinary skill in the art to choose any suitable particle size, including those sizes instantly claimed. In addition, a change in particle size is not considered to be a patentable distinction over the applied art because a change in size is generally recognized as being within the level of one having ordinary skill in the art. *In re Rose*, 105 USPQ (CCPA 1955).

14. Claims 17-20, 22, 24-25, 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chester et al. in view of Vasalos et al.

Chester et al. (US 4,437,978) discloses a cracking catalyst composition useful in fluidized catalytic cracking (FCC) processes. The reference teaches a catalyst composition co-impregnated with a combination of a rare earth oxide and with chromium, manganese, cobalt, nickel, or platinum group metals (column 1, lines 50-55). The composition further contains a zeolite, such as zeolite Y (column 2, lines 25-30).

Chester et al. teaches that a suitable rare earth metal includes cerium (column 3, lines 25-30). Table 1 details catalyst composition containing rare earth metals in amounts falling within the ranges instantly claimed. Refer also to examples 1-10. The composition further contains a matrix (column 4, lines 5-8).

Chester et al. does not teach the particle size of the composition.

Vasalos et al. (US 4,153,535) discloses a catalyst composition useful in FCC processes and teaches that the particles of the invention are in the size range of 20-150 microns such that they are suitable for fluidization (column 9, lines 35-40).

It is considered it would have been within the level of one of ordinary skill in the art to choose any suitable particle size, including those sizes instantly claimed. In addition, a change in particle size is not considered to be a patentable distinction over the applied art because a change in size is generally recognized as being within the level of one having ordinary skill in the art. *In re Rose*, 105 USPQ (CCPA 1955). Further, one of ordinary skill in the art would have been motivated to choose particles sized in the range instantly claimed in light of the teachings of Vasalos et al. that it is known for FCC process to have particles in the size range of 20-150 microns.

15. Claims 17-18, 21-22, 24-27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walker et al. in view of Miller et al. or Scherzer et al. and further in view of Vasalos et al.

Walker et al. (US 4,846,960) discloses a catalyst composition suitable for catalytic cracking processes, i.e. FCC processes. The catalyst composition comprises a zeolite, a silica matrix material, and vanadium oxide (column 1, lines 37-48). Walker et

al. teaches that a suitable zeolite includes zeolite Y, preferably a rare-earth exchanged zeolite Y (column 2, lines 30-45). The composition contains vanadium oxide in the range of from about 0.2-2 weight % (column 4, lines 10-15).

Walker et al. does not specifically teach the use of cerium as the rare earth metal in the REY zeolite.

Miller et al. (US 4,340,465) teaches a catalyst composition useful for cracking processes (column 8, line 15). Miller et al. teaches that it is desirable to exchange the original cations of the zeolite with rare earth metals, including cerium (column 8, lines 15-26 and 38-40). Miller et al. teaches that the rare earth metal content of the zeolite is generally from 0-22 % by weight (column 8, lines 30-35).

Scherzer et al. (US 3,676,368) teaches a catalyst composition useful for cracking processes (column 1, lines 5-10). Scherzer et al. teaches that it is desirable to exchange the ions of a faujasite zeolite with rare earth ions, including cerium (column 1, lines 40-45 and column 4, lines 12-15). Scherzer et al. teaches that the total rare earth content of the zeolite should be in the rage 6-14 % by weight and specifically teaches the use of a 1-55% by weight cerium solution, which would lead to 0.06-7.7 % by weight cerium in the zeolite (column 1, lines 40-45 and column 4, lines 12-15).

It would have been obvious to one having ordinary skill in the art to choose cerium as the rare earth metal in the catalyst taught by Walker et al. in light of the teachings of either Miller et al. or Scherzer et al. Walker et al. does not disclose the specific use of cerium, but rather teaches the generic group of compounds, "rare earth metals." The claims differ from the reference by reciting a specific species and a more

limited genus than the reference. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to select any of the species taught by the reference, including those of the claims, because an ordinary artisan would have the reasonable expectation that any of the species of the genus would have similar properties and, thus, the same use as the genus as a whole. Further, both Miller et al. and Scherzer et al. teach that cerium is a known promoter in catalytic cracking operations. Therefore, one of ordinary skill would have been further motivated to choose cerium as the rare earth metal, with a reasonable expectation of success from the combination.

The modified teachings of Walker et al. further do not teach the particle size of the catalyst composition.

Vasalos et al. (US 4,153,535) discloses a catalyst composition useful in FCC processes and teaches that the particles of the invention are in the size range of 20-150 microns such that they are suitable for fluidization (column 9, lines 35-40).

It is considered it would have been within the level of one of ordinary skill in the art to choose any suitable particle size, including those sizes instantly claimed. In addition, a change in particle size is not considered to be a patentable distinction over the applied art because a change in size is generally recognized as being within the level of one having ordinary skill in the art. *In re Rose*, 105 USPQ (CCPA 1955). Further, one of ordinary skill in the art would have been motivated to choose particles sized in the range instantly claimed in light of the teachings of Vasalos et al. that it is known for FCC process to have particles in the size range of 20-150 microns.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on (703) 308-1164. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-6078 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI
June 1, 2001

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